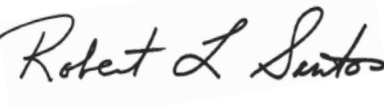




UNITED STATES DEPARTMENT OF COMMERCE  
U.S. Census Bureau  
Office of the Director  
Washington, DC 20233-0001

February 18, 2022

To: Jay Breidt  
Chair  
Census Scientific Advisory Committee

From: Robert L. Santos   
Director

Subject: Recommendations and Comments to the Census Bureau from the  
Census Scientific Advisory Committee Fall 2021 Meeting

The U.S. Census Bureau thanks the Census Scientific Advisory Committee for its recommendations. We are responding to the committee recommendations submitted during its 2021 Fall Virtual Meeting on September 23-24, 2021.

Your feedback is welcomed to ensure that the Census Bureau continues to provide relevant and timely statistics used by federal, state, and local governments, as well as business and industry, in an increasingly technologically oriented society.

Attachment

**Recommendations and Comments to the Census Bureau  
from the Census Scientific Advisory Committee  
Fall 2021 Meeting**

To: Robert L. Santos  
Director  
U.S. Census Bureau

From: Jay Breidt  
Census Scientific Advisory Committee (CSAC) Chair

Subject: Recommendations and Comments to the Census Bureau from the Census  
Scientific Advisory Committee Fall 2021 Virtual Meeting

September 23-24, 2021

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The Census Scientific Advisory Committee (CSAC) thanks the U.S. Census Bureau for all their work in preparing the Fall 2021 CSAC virtual meeting. Advisory staff helped ensure that CSAC members received presentation materials well in advance. Presentations were detailed and presenters were well prepared, keeping to their allotted time and engaging in useful discussion with CSAC. The technology supported discussion among Bureau staff and CSAC members in an accessible public forum. CSAC thanks the Bureau for their exceptional efforts in making this meeting a success.

CSAC reiterates two requests relevant to all future presentations: (1) that all presenters address specific questions to CSAC as part of their presentations, and (2) that presenters ensure their presentation materials are sufficiently detailed to allow CSAC members to offer thoughtful comments. Not all Fall 2021 presentations met these conditions exactly, though most did. The comments and recommendations of CSAC are most useful when these conditions are met.

CSAC also appreciates the responsiveness of the Bureau to previous recommendations, including establishing a task force that will focus on data for children across varied Bureau programs.

**I. 2020 Census Operational Quality Metrics**

This year, the Bureau published a series of tables describing preliminary operational quality metrics for the 2020 Census. The tables present state-level estimates of address resolution method, housing unit enumeration method by size of household, and item non-response rates by method of response, among others. The published tables help shed light on the operations of the 2020 Census, and they document that to a large extent the Bureau was able to meet its operational quality goals. CSAC commends the Bureau for publishing timely 2020 Census operational quality metrics at an unprecedented level of detail, as well as for completing the 2020 Census with virtually all its operational goals met. Much work remains

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to evaluate the overall quality of the 2020 Census. As this work gets underway, CSAC believes there are still some areas that need some additional amount of assessment.

Under normal circumstances, students who live in university dorms as well as off-campus housing can be miscounted, double counted, or counted in the wrong place. The Bureau took great care in ensuring parents know how to complete the questionnaire, when their children attend college away from home. But, with the pandemic, it became unclear whether parents should include children in their response to the questionnaire, when they would otherwise be living in their university dorm or off-campus housing on April 1st. As a result, CSAC is concerned whether university students were adequately enumerated in the 2020 Census and in the right location, and whether there was any measurable impact on aggregate demographic rates, such as average household size. The operational quality metrics published thus far do not shed light on this topic.

**1) CSAC recommends the Bureau publish a post-census evaluation report on the participation of students who live in university dorms or off-campus housing.**

The Bureau took great care in developing strategies to improve the participation of hard-to-count populations in the 2020 Census. In order to gauge the effectiveness of its efforts, operational quality metrics that shed light on the participation of specific hard-to-count populations are necessary.

*Census Bureau Response: The Census Bureau partially accepts this recommendation. We agree that it is important to understand the participation of historically hard-to-enumerate populations, and we will continue to study this in our 2020 Census evaluations and assessment reports, as well as in 2030 Census research and planning efforts. A separate evaluation report on the participation of students in university dorms or off-campus housing is not feasible to create. As you know, the 2020 Census had to rely heavily on facility administrative records after schools sent students home because of the pandemic, so participation of the students themselves was greatly reduced. Historically, college administrators select methods that allow students to self respond. During the 2020 Advance Contact operation, for example, over 40 percent of college administrators selected self-response methods, but we had to shift to other methods because of the pandemic. In addition, regarding off-campus students, those students in privately owned off-campus housing are included within the self-response universe and are not distinguishable between other self-response populations. Our planned 2020 Census analyses and operational assessments will provide information on all of the work we conducted during the census to ensure a complete and accurate count of both on-campus and off-campus students.*

**2) CSAC recommends the Bureau publish operational quality metrics for hard-to-count subpopulations in each state, including the unhoused population, young children, and others.**

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The third release of 2020 Census operational quality metrics included relatively high item nonresponse rates for group quarters at the National level: Age (18%), Race (30%), and Hispanic Origin (44%). In order to assess the operational quality of the Census, these rates should be disaggregated by type of group quarter to see if the non-response proportions are driven by a particular category of group quarters.

There is also interest in gauging the item response rates disaggregated by race and Hispanic origin for all types of housing units and group quarters.

***Census Bureau Response:** The Census Bureau partially accepts this recommendation. We know that there is much interest in more granular data for the operational quality metrics. We are assessing the feasibility of releasing more detail, such as selected substate metrics and by subpopulation, as part of our operational assessments. We will be publishing item nonresponse rates by type of group quarter in the operational assessment on item nonresponse and imputation rates, scheduled to be released in summer 2022. This will likely include the following types of group quarters: correctional facilities for adults, juvenile facilities, nursing facilities, other institutional facilities, college/university housing, military quarters, and other noninstitutional facilities.*

**3) CSAC recommends the Bureau publish operational quality metrics on the item non-response rates by type of group quarter (prisons, universities, nursing homes, etc.) and by other key demographic groups (race and Hispanic origin).**

CSAC commends the Bureau for its engagement with outside experts from the scientific and statistical community to conduct independent assessments of the 2020 Census. Reports from JASON, the American Statistical Association Quality Indicators Task Force, and the National Academy of Sciences (NAS) Committee on National Statistics will be helpful in understanding the quality of the 2020 decennial data and in planning for 2030. To ensure that such independent reviews have maximum effectiveness in 2030, it would be useful to have them chartered, convened, and given sufficient background materials and access to data systems in advance of 2030.

***Census Bureau Response:** The Census Bureau accepts the recommendation to publish operational quality metrics by type of group quarter. As stated above in #2, we will be publishing item nonresponse rates by type of group quarter in the final assessment on item nonresponse and imputation rates, scheduled to be released in summer 2022. This will likely include the following types of group quarters: correctional facilities for adults, juvenile facilities, nursing facilities, other institutional facilities, college/university housing, military quarters, and other noninstitutional facilities. In addition, we are assessing the feasibility of releasing item nonresponse rates by demographic group.*

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**4) CSAC recommends that the Bureau charter and convene independent, external review teams for the 2030 decennial census, and ensure that these teams have adequate access to background materials and data systems ahead of time.**

Given the evident impact that the COVID-19 pandemic has had on the operations of the 2020 Census, there will be much interest in studying the different mechanisms and impacts of the pandemic on the decennial Census. In fact, planning for the 2030 Census will evidently require that we ponder how the pandemic affected the 2020 Census. As such, it will be very useful for the Bureau to take the lead on researching and documenting every aspect of how the 2020 Census operations were impacted, not just in terms of schedule, but in terms of data collection particularly. For instance, using the 2019 ACS data collection as a pre-pandemic benchmark can provide insight into how the pandemic affected operations.

*Census Bureau Response: We thank the Committee for this recommendation. We will continue our tradition of consulting with our independent, external partners, such as the National Academies of Science, JASON, and others as we begin the process of planning for the 2030 Census.*

**5) CSAC recommends that the Bureau publish a post-census evaluation research report on the many ways the COVID-19 pandemic affected 2020 Census operations.**

CSAC encourages assessment of efforts in 2020 to improve the count of young children. As the qualitative evaluation of the undercount of young children being implemented as part of CPEX produces findings, it is imperative that the findings be utilized as soon as they are available to improve operations at all levels. After the 2010 Census, the Census Bureau produced several studies related to the young child undercount, but many of them were not posted until 2019 when it was too late to have an impact on planning for the 2020 Census. These studies should be updated with data from the 2020 Census to inform planning for the 2030 Census.

*Census Bureau Response: The Census Bureau accepts this recommendation. We are pursuing plans to develop a consolidated report within our 2020 Census Program for Evaluations and Experiments (CPEX) to study and document the operational and quality impacts of the COVID-19 pandemic across all 2020 Census operations.*

**6) CSAC recommends that the Bureau prioritize the timely update of assessments of the undercount of young children during the 2020 Census, so that they may be available to support 2030 Census planning.**

*Census Bureau Response: The Census Bureau agrees with this recommendation. All 2020 assessments and evaluations will be available to support the 2030 planning efforts, so such a specific prioritization is not needed. All 2020 assessments and evaluations are scheduled for completion by fiscal year (FY) 2024 Quarter 2. The vast majority (over 75%) are*

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*scheduled to be complete by the end of FY 2022 and over 95% are scheduled to be complete by the end of FY 2023.*

**II. Recent Challenges to Data Collection**

CSAC commends the Bureau for its methodological adaptations in several annual surveys for which data collection was adversely affected by the pandemic. These include the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), the American Community Survey (ACS), and several economic surveys.

Using administrative records linked to both responding and non-responding housing units, the Bureau examined differential response in the 2017-2020 CPS ASECs. While response bias in demographic characteristics was similar across all four years, differentials by education and income grew in 2020, with responding households having markedly higher W-2 earnings and 1040 adjusted gross income as well as higher levels of education than non-responding households. To compensate for these differences, the Bureau applied an alternative weighting methodology that makes use of administrative, census, and survey data linked to both responding and non-responding households. Compared to the traditional survey weights, these “entropy balance weights” reduced estimates of survey income across the distribution in the 2020 survey but not the earlier surveys. CSAC notes that the weighting methodology appears to be equivalent to the exponential form of survey calibration weighting. If so, it would be more useful to most users of the data if the weighting methodology referenced the survey literature: see Deville and Sarndal, 1992, “Calibration estimators in survey sampling,” *Journal of the American Statistical Association* and the extensive literature that follows it. While CSAC is not aware if custom software was developed for the entropy balance weights, we note that existing statistical software implements the exponential survey calibration methodology.

Using the entropy balance weights, the reduction in income in 2020 was about \$2,000 in median household income. Researchers studying the impact of the pandemic may be interested in using these alternative data for their work.

**1) CSAC recommends that the Bureau make the experimental weights available to researchers outside the Bureau--preferably as public use files but at least through the Federal Statistical Research Data Centers (FSRDCs).**

As a companion to this investigation of response bias, an evaluation of the quality of the responses would be useful in documenting the full impact of the pandemic on survey responses. The Bureau has previously compared survey income reports to amounts obtained from linked administrative records. Repeating such an evaluation for 2018-2021 could tell us if response quality for reported income changed.

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**Census Bureau Response:** *The Census Bureau accepts the Committee's recommendation. The Census Bureau will include additional citations to the long literature on empirical calibration.*

*The Census Bureau uses publicly available software for the empirical calibration which has been heavily used and cited and is one of many publicly available implementations of this technique (for example, <https://cran.rproject.org/web/packages/ebal/ebal.pdf> and [https://github.com/google/empirical\\_calibration](https://github.com/google/empirical_calibration)). This particular code was chosen for its computational efficiency relative to other methods tested. However, the Census Bureau is open to suggestions for other implementations that are similarly or more computationally efficient.*

*To an extent this application was developed with custom software, it was to address the particular modeling needs of Census Bureau surveys such as the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) and the American Community Survey (ACS), as discussed in our CPS ASEC working paper. Those include specifying a model conditional on the available linked data and reweighting the sample using balance constraints available at various levels of aggregation (the address and person level), analogous to two-step calibration in Estevao and Särndal (2006).*

*We plan on releasing the weights as part of our 2020 ACS 1-year Public Use Microdata Sample (PUMS) release. For the CPS ASEC experimental weights, we released a public-use weight file. The feedback from that release was extremely helpful in improving the weighting model implemented in the ACS. Additionally, the 2017-2021 experimental CPS ASEC weights are available for researchers to request through the Federal Statistical Research Data Center (FSRDC) data warehouse.*

**2) CSAC recommends that the Bureau compare survey income reports to amounts obtained from linked administrative records in order to assess response quality.**

The ACS collects data from independent monthly samples. During the 2020 calendar year, survey response was adversely affected by the pandemic beginning in March, but because of short-term changes in contact strategy and nonresponse follow-up, the months of March through June saw much greater reductions in response rates than later months. Because the customary ACS nonresponse adjustments did not yield data of acceptable quality, the Bureau elected not to release the annual ACS data products for 2020. As an alternative, the Bureau plans to release "experimental" estimates using entropy balance weighting--the methodology used to evaluate response bias in the CPS ASEC.

Given the imminent release of these experimental estimates, CSAC is interested in the evidence underlying the decision to withhold release of the traditionally weighted ACS data and to release experimental estimates instead. CSAC notes that an analytic report and a working paper are scheduled for release in the coming months.



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*Census Bureau Response: The Census Bureau accepts the Committee's recommendation. We would like to clarify that the decision to not release the 2020 ACS 1-year data was not because of a concern about the quality of the response we received, it was because of nonresponse bias due to responses we were not able to collect due to the pandemic. The evidence underlying the decision to not release the standard 1-year data was described in the analytical report titled "An Assessment of the COVID-19 Pandemic's Impact on the 2020 ACS 1-Year Data" released on October 27, 2021. This report details the data collection issues, the modifications to the standard weighting and estimation that were attempted to combat the collection issues, and the resulting data quality issues that informed the decision.*

*The set of tables with the experimental weights and accompanying technical working paper were also released separately from the analytical report. This report titled "Addressing Nonresponse Bias in the American Community Survey During the Pandemic Using Administrative Data" was released on November 30, 2021.*

**3) CSAC recommends that the analytic report and working paper include the evidence on which these decisions--to withhold release of the traditionally weighted ACS data and to release experimental estimates instead--were based.**

CSAC is particularly interested in how the alternative estimates will address differential response by calendar month. While the interview month is not released, equal representation of the survey months is important for the quality of certain annual estimates, such as those where monthly responses reflect seasonality (e.g., migration and labor force participation) or varying 12-month reference periods (e.g., income).

*Census Bureau Response: The Census Bureau accepts the Committee's recommendation. The Census Bureau has released an analytical report, titled "An Assessment of the COVID-19 Pandemic's Impact on the 2020 ACS 1-Year Data," that documents how the challenges in collecting responses in the ACS significantly impaired the quality of the resulting estimates, which were often inconsistent with benchmarks, administrative data, or changed in unexpected magnitudes. Despite our best efforts to mitigate the collection disruptions and modify the weighting adjustments, the outcome could not be fully evaluated until data collection ended. Unfortunately, even with modifications focusing on known sources of bias, the Census Bureau determined that the estimates did not meet the statistical quality standards. All together, these inconsistencies led the Census Bureau to decide to not release the standard set of 1-year ACS data.*

*A technical working paper titled "Addressing Nonresponse Bias in the American Community Survey During the Pandemic Using Administrative data" was released on November 30, 2021. The report does examine nonresponse bias by month for selected topics and describes the adjustments using the entropy-balance weights on mitigating the bias.*



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**4) CSAC recommends that the Bureau include in its analytic report a discussion of how response differentials by month were addressed with the experimental weights and demonstrate that these methods produced satisfactory results for characteristics with significant seasonal variation or varying annual reference periods.**

*Census Bureau Response: The Census Bureau accepts the Committee's recommendation. A technical working paper titled "Addressing Nonresponse Bias in the American Community Survey During the Pandemic Using Administrative data" was released on November 30, 2021. The report examined nonresponse bias by month for selected topics and describes the adjustments using the entropy-balance weights on mitigating the bias. We saw higher than usual monthly variation in many statistics, such as unemployment and labor force participation, especially during the pandemic. To address this as best we could, we adjusted the weights of the respondent sample in each month as part of the empirical calibration. The monthly samples were adjusted so that each month's respondents had 1/12<sup>th</sup> of the sample weight and so that their weighted moments matched targets estimated from the annual sample of occupied housing units for statistics such as W-2 earnings, changes in employment and earnings, Adjusted Gross Income from 1040 filings, etc.*

**5) Because ACS estimates of migration--internal as well as from abroad-- have come to play a critical role in population estimates, CSAC recommends that the efficacy of the experimental weighting methods with respect to estimates of migration be highlighted in this documentation.**

CSAC agrees with the Bureau that excluding the 2020 annual estimates from the five-year data products was not a viable option, as this would affect the five-year data through 2024. However, while CSAC acknowledges that the ACS data from the months with the weakest response rates form a small portion of the five-year total, CSAC would like to see evidence that the proposed inclusion of 2020 data with traditional or modified weighting methods yields satisfactory results.

*Census Bureau Response: The Census Bureau accepts the Committee's recommendation. The Census Bureau has determined that the 2020 ACS 1-year estimates would not be suitable for our purposes in measuring international migration in the development of our upcoming Vintage 2021 estimates series. Instead, we have developed a method that applies an adjustment to the 2019 ACS 1-year estimates. Our domestic migration component relies on data from the Internal Revenue Service, Medicare, and the Social Security Administration, not the ACS, so this was not impacted. The Census Bureau announced on November 10, 2021 that we were delaying the release of the standard 2016-2020 5-year data and that an update would be forthcoming in December. On December 20, 2021, the Census Bureau announced that we refined the methodology to improve the 2020 data inputs and integrate them with the 2016, 2017, 2018, and 2019 inputs that were processed using the standard methodology. As we continue to evaluate and make decisions on the 2016-2020 ACS 5-year*

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*data products, the Census Bureau will document the alternatives that are considered. Documentation on the final methodology will also be provided when available.*

**6) CSAC recommends that the Bureau present empirical evidence in support of its plans for the five-year data products including an evaluation of alternative approaches. This summary should address implications for all levels of geography.**

ACS estimates are used to allocate hundreds of billions of dollars in federal and state funding. Many of these programs involve children. CSAC would like to know the implications of the challenges faced by the 2020 ACS, and particularly the alternative estimation strategies, on funding allocation.

Conduct of several business economic surveys was affected by factors at both the Bureau and at sampled businesses. The Census Bureau's National Processing Center, which supports these surveys, has relied heavily on mail operations by staff working on-site; overnight conversion to telework was not feasible. We understand from the presentation that these limitations are being addressed in a variety of ways. CSAC commends the Bureau for these efforts.

Unlike the CPS and ACS presentations, the presentation on economic surveys did not mention any evaluations of data quality that have been completed or planned and did not indicate whether any adjustments to the data, through weighting or otherwise, have been necessary to meet internal quality standards. CSAC requests that the Bureau provide an update on completed or planned evaluations of economic data quality at or before the spring meeting.

With regard to the business respondents, sampled businesses were accustomed to receiving mailed questionnaires with detailed financial questions that required staff to consult company documents at their offices. It is not clear why remote, electronic access to company financial records would pose a significant problem for respondents at most businesses these days. CSAC would appreciate more information on the nature of this problem. Perhaps this remains an issue for many small businesses. If so, the success of the Small Business Pulse Survey suggests an avenue for learning more about such issues.

***Census Bureau Response:** The Census Bureau accepts the Committee's recommendation. As we continue to evaluate and make decisions on the 2016-2020 ACS 5-year data products, the Census Bureau will document the alternatives that are considered. The Census Bureau will also provide documentation on the 2016-2020 ACS 5-year methodology. Additionally, as a data provider, the Census Bureau is not privy to details on the funding formulas used by other federal agencies. The goal of the Census Bureau's preparation and evaluation of the 2016-2020 ACS 5-year data are to provide the highest quality data possible, while providing appropriate guidance to data users regarding any known issues. Methodological*

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*adjustments were made to minimize the impact of the non-response bias present in the 2020 ACS 1-year data, but they will not be able to be eliminated entirely.*

*Regarding the evaluations of economic data quality, processing and data quality for all economic surveys were monitored throughout the pandemic, just as they would have been prior to the pandemic. Quality metrics, such as response rates and coefficients of variation, were continuously monitored and evaluated throughout each survey's data collection for their respective published estimates. For an example of frequently asked questions related to the pandemic for one of our economic indicators, see <https://www.census.gov/retail/mrts/www/covid19mrtsfaq.pdf>.*

*Additionally, the economic surveys have some evaluations that are in various stages of development. The evaluations are focused on imputation for the 2020 annual retail, wholesale, and services surveys. We will provide the committee with the findings of these evaluations when they become available.*

*The Economic Programs Directorate has also done some review of the administrative data we receive from IRS and made some adjustments to the standard imputation process of quarterly payroll and employment data for values that are either missing or have been potentially reported as zero in error. Specifically, for all quarters of data, an adjustment factor (by sector and quarter) was added to the imputation process for any missing payroll and employment values. The adjustment factors were based on observed data from cases with non-missing values. Also, for selected quarters, reported zero values for payroll and employment were NOT imputed as would typically have happened. This was done due to the uncertainty regarding the impact of the pandemic on employment in these particular quarters.*

*Additionally, the annual Nonemployer Statistics (NES) data product uses administrative data that we receive from IRS. However, because of limited availability of the source data when compared to prior years and its potential effects on the published tabulations, we postponed the release of the 2019 NES tables. Census continues to work closely with IRS to obtain the additional records needed to produce the 2019 NES data product. A revised release date will be posted on the Census Bureau website when available.*

**7) CSAC recommends that the Bureau explore the prospect of using the Small Business Pulse Survey or a similar vehicle to collect information on the limitations that small businesses may face in providing business or economic data electronically.**

**Census Bureau Response:** *The Census Bureau accepts the Committee's recommendation. The Census Bureau has several collection instruments where this could be explored, including the Small Business Pulse Survey as well as the Annual Business Survey. For example, the 2018 Annual Business Survey (ABS) collected data from over 4.6 million respondents who provided information about the share of their business records are kept in*

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*electronic format. [Table 1A ABS - Digital Technology Module 2018](#) provides detailed data at the national, subsector, and state levels on digital record keeping across six domains (personnel, finance, customer feedback, supply chain, marketing, production, and other). While published tables do not include business size class, the Census Bureau could research whether the lack of digital record keeping is more prevalent with small firms using the ABS microdata.*

**III. Frames Program**

CSAC commends the Bureau for its efforts to achieve both the cost savings and improved data products promised by the Frames Program. The Frames Program's vision is to provide efficient and direct linkages of information contained in the Bureau's four major data frames (MAF/geospatial, business, jobs, and demographic), heretofore existing in a largely uncoordinated and unintegrated environment. The Frames Program aims to render these separate frames "linkable in nature, agile in structure, [and] accessible for production or research on a need-to-know basis" while maintaining the Bureau's best-practice standards in data management, technology usage, and methodology. The Frames Program seeks to link the four main data frames so as to coordinate information coverage across frames, reduce duplication of identical data existing in more than one frame, allow for changes in one frame to automatically trigger updating data in other frames, reduce the reporting burden on Census Bureau stakeholders and partners, and create efficiencies for the end users of Census Bureau products. These efficiencies promise to effect cost savings (e.g., increasing the proportion of "in-office" solutions to data challenges) that might allow for the reallocation of Census Bureau budgetary resources to identifiable areas of need (e.g., improving coverage of "hard-to-count" sub-populations). This combination of improved data quality and coverage, on the one hand, and cost-reducing efficiencies, on the other, will represent a laudable achievement for the Bureau.

Inasmuch as some administrative records data are skewed to register the transactions of individuals who are otherwise "easy to count" (i.e., individuals with frequent and consistent interaction with the sorts of public and private institutions listed above), and to under-count individuals who are otherwise "hard-to-count" (i.e., individuals who by virtue of their socio-economic, cultural, or other circumstances are less likely to interact with such institutions), increased reliance in updating data frames on administrative records may result in exacerbating the tendency to undercount less "visible" sub-populations. For example, it has been cited that non-Hispanic Whites tend to be over-counted in the decennial census by perhaps three-quarters of one percent, while non-Hispanic Blacks and Hispanics tend to be under-counted by 1.5-2.0 percent. What impact will an increased reliance on administrative records have on the tendency to over- or under-count sub-populations in areas beyond the census itself? If administrative records are used to solve traditional non-response issues (which tend to be associated with less visible sub-populations), will this practice exacerbate the under-counting of these groups? What will be the consequences for estimates of non-response themselves?

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**1) CSAC recommends that the Bureau investigate the impact of the data linkages gained from the Frames Program – which may rely more heavily on administrative records – on traditional “hard-to-count” sub-populations.**

*Census Bureau Response: The Census Bureau accepts this recommendation. Frames Program staff have and will continue to confer with subject matter experts inside and outside the Census Bureau to understand and document coverage issues related to administrative records. We note that, while the Demographic Frame has relied heavily on administrative records data in the initial development phase and will rely on administrative records data for updates in the future, it also will utilize data from the decennial census and surveys.*

CSAC notes that the use of administrative records alters the traditional balance of agency in the processes used to collect the data needed by the Bureau and its partners. Traditional methods of data collection (e.g., street-by-street canvassing, mailed physical census surveys/questionnaires) place agency in the hands of the individuals being surveyed. The data collected is supplied by the subjects of the inquiry. Collecting data “administratively” removes that level of agency from the individuals involved. Data is “received” or “ingested” by the Bureau, but those data are not “supplied” in the sense described above. If the Frames Program’s mechanism of data sharing across the four data frames entails an enhanced impact of administrative records, and if the sense of agency loss suggested above obtains within the public, privacy concerns could result in an increase in the non-response rates to traditional survey instruments.

**2) CSAC encourages the Bureau to investigate the public’s awareness of the Bureau’s reliance on administrative records and any potential implications of this reliance on the public’s willingness to engage with the Bureau’s traditional methods of data collection. CSAC recommends that these investigations be included in the currently planned mixed methods assessment of the Frames Program.**

*Census Bureau Response: The Census Bureau accepts this recommendation. We are implementing a mixed-methods study (see #3 below) to assess reactions to use of administrative records to develop the Demographic Frame. Over the course of the study, we will listen for concerns about general use of administrative records data and plan for additional research into public perceptions. Regarding the concern about loss of the sense of agency, the Census Bureau does not foresee the Demographic Frame and linkages between other frames as replacing opportunities for respondents to participate directly in censuses or surveys; rather, we see the Demographic Frame and other frames as supporting censuses and surveys in cases of nonresponse, improved sample design, and reduction of respondent burden by selective reuse of data already provided by respondents. In thinking about reuse of data, we recognize that some characteristics of an individual might change over time as the way in which the individual identifies changes; this points to the need for a variety of*

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*sources (censuses, surveys, and administrative records) with which to update and maintain the Demographic Frame as well as sufficient frequency of data collection to detect changes.*

Likewise, the collection of administrative records data involves the procuring of confidential information from a variety of public and private entities, some of which carry with them an assumption of privacy (e.g., credit bureau data). Additional administrative records data perhaps not yet collected by the Bureau but being discussed as future data sources (e.g., internet, water, electrical, connectivity at physical addresses) raise further privacy issues. In sum, the use of administrative records is a cost-effective and less invasive method for collecting the data required for the Bureau's mission. Yet the sources, types, scope, and granularity of data being collected by the Bureau, out of sight as it were of those to whom those data belong, can lead to privacy concerns among the general public. The worry exists that in the public mind the "for statistical purposes" mandate of such provisions within Title 13 USC, the Privacy Act of 1974, and 2002's Confidential Information Protection and Statistical Efficiency Act (CIPSEA) is rendered rather too elastic by the collection of certain administrative records for Census Bureau purposes. The Census Bureau's Frames Program Update presentation (September 2021) acknowledges this concern and the need to assess the public's perception of the use of administrative records to develop the demographic frame.

**3) CSAC applauds the Bureau's development of mixed-methods assessments that will gauge the level of public comfort with the Bureau's reliance on administrative records to create the Demographic Frame as implied by the Frames Program. CSAC recommends that this effort specifically assess how the public's comfort varies between governmental and non-governmental data sources. CSAC notes that the results of these assessments could inform a strategy for communicating the parameters of the Frames Program and the privacy safeguards in place.**

*Census Bureau Response: The Census Bureau accepts this recommendation. We are starting the process of developing questions for the mixed-methods study and will incorporate questions that allow us to assess differences in public comfort between use of administrative records from governmental and non-governmental sources.*

The Frames Program envisions the linkage and interconnectedness of the four enterprise frames such that changes or updates in the data within one frame will trigger a change or update in data in additional frame(s). However, in linking the frames at the start of the process, it is not clear what rules or procedures are in place to reconcile conflicting data across frames. Some conflicts are due to competing nomenclature (e.g., the Employer Identification Numbers (EINs) used by the IRS to identify a business entity versus the State Employer Identification Numbers (SEINs) used at the state level), while others may be due to updated data in one frame (e.g., the Business Frame) being unlinked to older data in a separate frame (e.g., the Jobs Frame). For example, the Bureau has identified the enhancement of linkages between data residing in the Business Frame, on the one hand,



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and the Jobs Frame, on the other. As cited above, much of the harmonization required here is a product of the different approaches of federal- versus state-level entities.

Inasmuch as the respective foundational data frames have been constructed separately, the process of linking the data in the different frames will generate cases of conflicting data. Analyzing these areas of conflicting data and explicating the methods to be used in resolving them would be a valuable addition. An assessment of the characteristics of the individuals, jobs, and businesses where such resolution was necessary would be essential to an understanding of the potential impact.

**4) CSAC recommends that the Bureau explicate the methodology for resolving or reconciling conflicting data existing in different frames.**

*Census Bureau Response: The Census Bureau accepts this recommendation. We agree that harmonization and crosswalks of data, as appropriate, are needed to facilitate linkage and utility of linked data. We also recognize that as we work through the process of harmonizing and linking data, we will find data and attributes that conflict from one frame to another. In some instances, harmonization of concepts and definitions will be needed. In others (such as the EIN and SEIN example), crosswalks and other information relating data will be needed (e.g., EIN 1 comprises SEIN 2 and SEIN 3). In yet other instances, new attribute types will need to be added as valid values (e.g., adding a “mixed use” category to the Master Address File to identify addresses at which both residential and nonresidential activities take place). An additional approach is to keep all conflicting data and build a multiple imputation system to represent the certainty or uncertainty around each data point, including identifying a “best” value, but also preserving the full range of values for those who are interested. The Frames Program will share methodologies and plans for resolving or reconciling conflicting data with the CSAC as they are developed.*

Surveys frequently undercount the number of young children. Working with multiple administrative data sources may improve the count of young children. CSAC would like to know what data sources will be used to identify young children, e.g., Vital Statistics, Medicaid, WIC, TANF, and SNAP. For which databases are personally-identifiable data available to the Bureau in a timely manner? Are analyses planned to assess the extent to which young children are included in Frames?

**5) CSAC recommends that the Bureau evaluate the impact of the Frames program on the accuracy of data about young children.**

*Census Bureau Response: The Census Bureau accepts this recommendation. The Frames Program intends to develop a Demographic Frame that is as complete and accurate as possible. To that end, Frames Program staff will consult and work with subject matter experts inside and outside the Census Bureau to identify the range of administrative records sources that may encompass young children (as well as other hard-to-count/locate*



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*subpopulations). We will work with subject matter experts to measure gaps in coverage from both a demographic and geographic perspective so as to inform 1) research relating to additional administrative records sources to potentially fill gaps, 2) planning for data collection efforts designed to fill gaps in the Demographic Frame, and 3) uses of the Demographic Frame for analytical and product creation purposes.*

The Frames setting provides a vast array of data. An internal citation standard will provide a mechanism for referencing, dating, and versioning data sets extracted and used for internal purposes. This standard also eases the re-creation and/or updating of specific data extractions to be used by multiple users internal to the Bureau. Some of these products may be available for external use and the citation format would allow connection to standard external citation formats such as Digital Object Identifiers (DOI) and other data citation standards.

**6) CSAC recommends that the Frames team explore reference and citation standardization when referring to extracted data products.**

*Census Bureau Response: The Census Bureau accepts this recommendation. Development of a reference and citation standard for data products derived from one or more frames presents an interesting challenge given the variety of censuses, surveys, administrative records, and field data collection activities that contribute to the ongoing update and maintenance of each individual frame. We agree that data users will want the variety of sources that contribute to information contained in various data products. The Frames Program is in its early stages and products derived from the linked frames are still a few years off, but we will begin discussions related to standardization of references and citations.*

The Bureau is currently facing a decision on the design and architecture of the linkage infrastructure envisioned by the Frame Program. As currently constructed, three of the four data frames exist in separate locations and in different server environments. The fourth frame (i.e., the Demographic Frame) is under construction but will eventually be migrated as well into a permanent environment. The linkages envisioned by the Frames Program may assume three different architectural approaches:

- (1) develop infrastructure that links the frames in their current location?
- (2) link copies or extracts of the four frames in the Enterprise Data Lake (EDL)? (the EDL is the Bureau's central data repository, built up from 2017-20)
- (3) consider both approaches?

CSAC expertise on this question may be leveraged as a result of a presentation by the Frames team that considers the costs and benefits that are associated with each respective approach to the question. To leverage this expertise, CSAC needs further information about the criteria the Bureau will use to make the decision (e.g., efficiency?)

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**7) CSAC recommends that the Frames team deliver a presentation to CSAC at which the perceived costs and benefits of the varying approaches to the design and architecture of the linkage infrastructure are assessed and discussed.**

*Census Bureau Response: The Census Bureau would like to clarify that in posing the question that led to this recommendation, the Frames Program was hoping the CSAC could help guide the team as to costs and benefits of the design and architecture approaches that were listed based on Committee members' expertise and/or knowledge of other organizations' efforts to link foundational datasets. The Frames Program needs to bring on a systems architect and a systems engineer to lead planning and design of linkage infrastructure and to adequately assess costs and benefits to the varying approaches. In the meantime, the Frames Program will consult with Information Technology experts within the Census Bureau to gather insights and suggestions with regard to the design and architecture questions that we posed during the CSAC meeting.*

**IV. Status Update: 2020 Census Data Products and Stakeholder Engagement Plans**

CSAC recognizes the extraordinary conditions under which Census 2020 Data Products are being developed and commends the Bureau's commitment to data quality, stakeholder engagement, and transparency. Application of differentially private (DP) disclosure avoidance systems is one of the core challenges associated with preparing Census 2020 data products. This is new territory. Immense resources and time went into preparing the Redistricting Data release (Aug 12, 2021), and important lessons were learned. Now that those data have been released, the Bureau is turning its attention to the even more complex task of balancing privacy and accuracy in the Demographic and Housing Characteristics (DHC) files.

**1) CSAC recommends that in the process of evaluating Census 2020, the Bureau produce a post-evaluation report critically reflecting on the successes and failures in implementing differential privacy thus far, including how these lessons can be used to inform future applications of differential privacy and the relationship between the TopDown Algorithm in the redistricting data file and DP application in the DHC file.**

Data users are currently working with redistricting data, both for redistricting purposes and numerous other endeavors. Given that additional Census 2020 data will not be released for several months and potentially over a year (and for some small units, such as blocks, perhaps never), this particular redistricting file will most likely be used for more activities than ever before. Users are currently struggling with interpreting differentially private data. It is possible that the public will lose faith in data quality, and as a consequence the larger enterprise.

Locals are often using the data and know the blocks well, and they sometimes find they cannot ground-truth the data. How should Census Bureau partners explain these inconsistencies such that they simultaneously foster trust in data quality and transparently

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recognize noise? Partners and users need this kind of guidance as soon as possible.

Users are also reviewing the data to document neighborhood-level change in race/ethnic population composition and are finding that for population sub-groups (race/ethnic) at census tract or even county levels, that data sometimes appear inconsistent. In these cases, guidance around data accuracy expectations based on geographic level and sub-group population sizes would be extremely helpful. For example, data might be interpreted recognizing that “small” populations could have significant noise in the data. But how small is “small” and for what variables and uses? When are the data good enough to use, for what purposes, and when are they not?

***Census Bureau Response:** The Census Bureau accepts the recommendation to conduct an assessment of the implementation of the new disclosure avoidance methodology for the 2020 Census data products.*

**2) CSAC recommends that the Bureau release guidance for users of redistricting data on interpreting differentially private data for various uses. The Bureau should also release guidance on when and how to aggregate to larger geographies to increase accuracy. This guidance should come as soon as possible.**

CSAC commends the Bureau’s continued efforts to engage key stakeholders in evaluating the impact of differential privacy on a variety of data uses prior to final decision-making on how to implement this practice. The plan to coordinate a National Academy of Sciences workshop evaluating DHC demonstration data, similar to the workshop held in December 2019, is particularly welcome. CSAC recognizes that 30 days is a very short period of time for users to fully evaluate the data, particularly when enormous microdata files are released which relatively few users have the capacity to digest. With prior demonstration data releases, IPUMS did much of the work processing microdata into more digestible tabular format and this kind of extra processing would likely take even more time with the more complex DHC file.

***Census Bureau Response:** The Census Bureau accepts this recommendation. We have been working with the Population Reference Bureau (PRB) on the development of a 2020 Census handbook series explaining differential privacy implementation and its impacts. The first handbook, “Disclosure Avoidance for the 2020 Census: An Introduction” was released in early November. Here is a link to the handbook: <https://www2.census.gov/library/publications/decennial/2020/2020-census-disclosure-avoidance-handbook.pdf>. This guide provides information and guidance along the same lines as what is being suggested. We will also continue to look for ways to better communicate this information.*

**3) CSAC recommends that the Bureau make demonstration data available in formats that are easily digestible in tables for each of the production tables planned. Further,**

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**CSAC recommends that the Bureau make public announcements in advance of the demonstration data release, so that analysts can plan ahead to devote the time to evaluate data and engage. CSAC suggests the Bureau set an engagement time period longer than 30 days, at minimum of 45 days. If demonstration data are released in microdata format, then users will need even more evaluation time.**

*Census Bureau Response: The Census Bureau accepts this recommendation. The Census Bureau plans to continue its extensive engagement with data users throughout the development period for the DHC and Detailed DHC. This will include providing demonstration products intended to provide information on the potential accuracy of these products in formats that are accessible by data users with various levels of technical expertise. When possible, we also plan to make demonstration products available that will allow more experienced data users greater flexibility in conducting their assessments. We also will seek to provide data users with as much time as is possible to assess each demonstration product. This includes extending the feedback time period from a minimum of 30 days to a minimum of 45 days.*

**4) As the Bureau continues to engage with stakeholders, CSAC recommends adding to the stakeholder engagement list data clearinghouses (for example, IPUMS, Social Explorer and others), as well as representatives of child advocacy groups and other hard-to-count and historically excluded groups.**

In considering both the application of differential privacy and the design of data products, it is critical to consider how the data are used (use cases). This is clearly on the minds of the Census Bureau. CSAC has in the past (as requested by the Bureau) helped to identify suggested use cases for consideration, but we are not a user working group. The Bureau may find it helpful to convene one. The number of use cases is enormous and complex, which speaks to the utility of the census! It would be impossible to identify all potential use cases, still the Bureau could clearly document known uses with as much diversity as possible.

*Census Bureau Response: The Census Bureau thanks CSAC for this recommendation and will continue outreach with these stakeholders and data user groups as well as seek ways to expand to other stakeholder groups.*

**5) CSAC recommends that the Bureau develop and staff an office with responsibility and adequate resources for maintaining a database of all known data use cases and for engaging with data stakeholders when changes to data products are considered. Data use cases would include (but not be limited to) government agency research (e.g., frames and control totals for other surveys), government policy and funding formulas (federal, state, and local), legal mandates and regulations, community planning (children's & elder services, infrastructure, emergency management, etc.), business planning, and academic research.**

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CSAC is glad to see the Bureau considering new ways to improve data accuracy in the DHC files, while still protecting privacy, whether by releasing some data only at larger geographies and/or by reconsidering basing all tables on microdata. Considering geographic scale of data products, CSAC suggests that the Bureau consider constructing gridded data for future data products, as is done by the census of Japan (see <https://www.stat.go.jp/english/data/mesh/01.html>). Gridded data built on the finest spatial units (such as census blocks) would not in all locations (or variables) meet the privacy protection standards of the new disclosure avoidance system, but the Bureau could consider using variable-resolution inputs or other methods appropriate for spatial data in the production of such grids. Gridded data would permit flexibility of use with many higher-order geographies, both those already produced by the Bureau and ones of interest to a wide variety of users.

*Census Bureau Response: The Census Bureau thanks CSAC for this recommendation; however, we must reject this recommendation. The Census Bureau agrees that collecting, curating, and synthesizing a comprehensive set of data use cases for census data is important to informed decision-making regarding the census. However, the Census Bureau does not agree that setting up and staffing a new office is necessary to accomplish this effort. The Census Bureau agrees to build a repository of use cases utilizing existing programmatic offices and looks forward to updating the committee on our progress. Additionally, the Census Bureau is proud to announce the establishment of a new enterprise level office to continue national partnerships throughout the decade.*

**6) As the Bureau determines the geographic scale at which to release DHC data, CSAC recommends that the Bureau prioritize political units, such as places/minor civil divisions, and also prioritize tracts. Minor civil divisions could be geographically larger than tracts in rural areas, and these are political units that require data for decision-making and funding.**

Producing differentially private microdata requires allocating substantial privacy loss budget to cross-tabulations that are never published. Not producing these microdata could preserve the privacy loss budget, increasing data accuracy without compromising privacy. At the same time, users do use microdata in the PUMS sample files, and they access 100% microdata through the Federal Statistical Research Data Centers (FSRDCs).

*Census Bureau Response: The Census Bureau thanks CSAC for this recommendation but must reject the prioritization order at this time. However, we will consider this input as we determine the priorities.*

**7) CSAC recommends the Bureau continue to evaluate the positive and negative implications of not producing microdata that underlies DHC tables, in collaborating**

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**with stakeholders. Unless there are compelling use cases, extreme data inconsistencies between tables, or other critical negative consequences, CSAC recommends the Bureau does not produce differentially private 100% microdata as the underlying basis for DHC tables.**

*Census Bureau Response: The Census Bureau accepts the recommendation to evaluate the implications of not producing microdata that underlie the DHC tables. The Census Bureau will base the decisions about producing microdata on the results of experiments that are being conducted to determine the gains in accuracy that can be achieved and how that impacts the usefulness of the data for identified use cases.*

**8) Because tables protected with differential privacy are not necessarily internally consistent in the sense of adding up, CSAC recommends that the Bureau develop a consistency metric to be included in the DHC demonstration data to measure the amount of departure from internal consistency.**

*Census Bureau Response: The Census Bureau thanks CSAC for this recommendation but must reject the recommendation at this time. We are currently evaluating the advantages and disadvantages of enforcing or relaxing the consistency requirement and will report back to the committee when that evaluation is complete.*

**9) CSAC recommends that the Bureau devise a plan for how they can make sample microdata available to users through a PUMS file and how they can make 100% microdata available through the Federal Statistical Statistical Research Data Centers (FSRDCs). The Bureau should also save some of the privacy loss budget for special tabulations that may need to be created and published at a later date.**

*Census Bureau Response: The Census Bureau thanks CSAC for these recommendations and accepts the FSRDC option for making some form of microdata available. The Census Bureau will continue to consider options for producing a public use microdata file and the mechanisms and processes needed to allow for the development of special tabulations to meet data user needs not met through the standard products.*

**10) CSAC recommends that in making decisions about applying DP to the DHC file, the Bureau consider that many users will be looking to make comparisons over time. Decisions should be made with that in mind.**

The noisy counts used during the TopDown Algorithm provide an unbiased estimate of the counts which can be valuable in statistical analyses. A recent request to the Bureau asked that they publish the noisy measurements to facilitate such analyses. The Bureau has raised concerns that the number of noisy measurements is a lot larger than the number of statistics released in the PL tables and one of the options is to publish only the unbiased estimates corresponding to the statistics released in the PL tables. This option strikes a



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reasonable compromise and will allow for the kind of analyses above.

The Bureau can also publish the standard deviation of the noise for each of these numbers. These can be released as a research product, with the understanding that the PL tables reflect the official counts. The full set of 16.6 billion noisy measurements could be made available through FSRDCs.

*Census Bureau Response: The Census Bureau accepts the recommendation to keep in mind that data users will be making comparisons over time when making decisions about DP and the DHC file.*

**11) CSAC recommends that the Bureau publish unbiased estimates corresponding to the 3.4 billion statistics released in the PL 94-171 tables, along with information about the covariances of the noise generation process.**

*Census Bureau Response: The Census Bureau thanks CSAC for this recommendation but must reject the recommendation at this time. The Census Bureau will continue to engage with stakeholders on the feasibility of releasing the noisy measurements file.*

## **V. Count Question Resolution**

CSAC commends the Bureau for its development of the 2020 Count Question Resolution (CQR) process, and for the inclusion of group quarters within the scope of CQR. CQR represents an important element for assuring data quality in the future because it will inform future Census operations. It will also correct inevitable errors as it sets the base for the population estimates program, which should improve population data in the future. In addition, CQR should strengthen the confidence of states and communities that accuracy is the goal of the Bureau.

The CQR process and its expansion of scope seems particularly important for the 2020 Census, given that some people left their usual residence because of Covid and because of the difficulty of counting people in group quarters. Also, the usual Count Review 2 processes, in which group quarters counts are reviewed by state demographers, were cut short, so that challenges may be more frequent and more complex. It's good that the Bureau is expanding the opportunities for CQR, and we look forward to hearing more at future CSAC meetings as the process moves forward. The recent legal decision, noted in the presentation, is new, and the implications are not clear, so we look forward to hearing about other possible avenues that would allow governments to request a review of group quarters population counts, in order to improve population estimates within legal bounds.

In sum, the information presented so far shares a laudable overview of the Count Question Resolution Process itself, but little about what happens to the information that arises from this work. In other words, we have heard about the first multi-step multi-year phase, but



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not about the next very important forward-looking phase. As the work unfolds, additional updates would be welcome.

***Census Bureau Statement:** The Census Bureau would like to clarify that, since the CQR operation was first implemented following the conclusion of the 1990 Census, its scope has been limited to a review of the already-collected decennial census data, not new housing and population data provided by participants. Data collection for a decennial census concludes with the delivery of the counts to Congress and the President for Reapportionment. Therefore, the Census Bureau is considering a new, separate operation to collect new information about Group Quarters to inform the Census Bureau's population estimates programs. Accordingly, the Census Bureau posted a federal register notice to propose the 2020 Post-Census Group Quarters Review operation. The 60-day comment period ended in late January, and Census Bureau staff are assembling responses to the comments received in preparation for a 30-day posting and approval from the Office of Management and Budget to implement the 2020 PCGQR operation.*

**VI. Annual Integrated Economic Survey**

The Committee on National Statistics reviewed the Bureau's portfolio of annual economic surveys and summarized its findings and recommendations in the National Academies' Consensus Report *Reengineering the Census Bureau's Annual Economic Surveys*. Based on these recommendations, the Bureau's Economic Directorate initiated a large-scale program entitled the Annual Integrated Economic Survey (AIES) in 2019, and defined a multi-year development process aiming for full implementation by 2024.

CSAC commends the Bureau on undertaking this large-scale effort and acknowledges the careful steps in place.

CSAC recognizes the large and diverse set of stakeholders associated with the AIES, including stakeholders from all previous annual economic surveys and new stakeholders engaged in the integrated survey.

CSAC also recognizes accomplishments to date including the completion of an initial Stakeholder Engagement Plan, the Annual Program Requirements, and a study of record-keeping practices to determine how businesses retain information to be included in the proposed AIES.

**1) CSAC recommends ongoing annual updates to both the Stakeholder Engagement Plan and the Annual Program Requirements in the years leading up to the 2024 AIES implementation. CSAC further recommends defining a schedule for review and updating of both on a regular basis following AIES implementation.**

CSAC appreciates the challenges involved in consolidating separate surveys into the AIES as identified and listed by the Bureau.

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Defining the AIES will require selection of the final choices for both the collection unit and the processing system. These choices will require comparison between units/systems in use for existing surveys and any new possibilities. The Internal and External Stakeholders can provide valuable insight into high priority use cases and associated criteria for selection.

*Census Bureau Response: The Census Bureau accepts the recommendation. Both the Stakeholder Engagement Plan and the Annual Program Requirements will be updated on a flow basis. Stakeholder Engagement Plan updates will occur as we continue our outreach efforts. The Annual Program Requirements document will be updated with developments that evolve out of AIES sample design. We will establish checkpoints at the end of each quarter to review and confirm the updates have been captured accurately. Additionally, we will provide updates to the Committee.*

**2) CSAC recommends that the Bureau clearly define the criteria for selection driving the final choice of collection unit and processing system with input from representatives from both the Internal and External Stakeholder Communities defined in the Engagement Plan.**

CSAC commends the Bureau for its pilot survey planning and adds that this strategy can be enhanced through multiple pilots to supplement a larger multi-purpose pilot. Smaller pilot projects can provide valuable insight into performance of the potential processing systems and module content to highlight positive and negative aspects in light of AIES goals and requirements.

*Census Bureau Response: The Census Bureau accepts the recommendation. The Census Bureau continues to conduct outreach with AIES stakeholders, documenting and capturing needs for data items we plan to collect with an eye toward publication plans. In conjunction with considering stakeholder needs we analyze cognitive testing results related to the respondent's accessibility to data and ease of reporting at varied collection unit levels. Once collection units have been finalized for each data item, they will be mapped to our processing system(s) to ensure we capture respondent data accurately.*

**3) CSAC recommends that the Bureau use small, focused pilot assessments of potential processing systems to provide insight on modes of comparison and insight on the choice of collection unit.**

CSAC commends the Bureau for its thorough AIES Stakeholder Engagement Plan. The Stakeholder community can provide a valuable catalog and categorization of primary use cases for future AIES data products as compared to past use of data from the component surveys. While no list of use cases will be complete, the Stakeholder community can provide valuable insight into potential continuity impacts, for example, that of limiting data to the state by industry level.

*Census Bureau Response: The Census Bureau accepts the recommendation. The Census Bureau is using a phased approach for the AIES pilot. Due to timing and collection*

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*instrument limitations, we will conduct one large pilot, but account for incremental updates to content and the modular design during each phase. We will conduct three phases that run from January 2022 through May 2023. Each phase will be clearly defined and target specific testing goals. As decisions are made regarding AIES processing system(s), we will run simulations with test data sets and pilot data to ensure critical needs are met and identify positive and negative aspects of the processing system(s).*

**4) CSAC recommends that the Bureau query Stakeholders to identify use cases that would be impacted by limiting AIES data to the state by industry level.**

***Census Bureau Response:*** *The Census Bureau accepts the recommendation. The Census Bureau continues to meet with stakeholders to conduct outreach and gather information. In addition to the information initially captured from our key federal stakeholders (BEA, BLS, FRB, and CMS), we continue to seek targeted information related to the critical needs of our stakeholders. Key areas of focus include but are not limited to outlining requirements for the necessary NAICS levels, geographic levels, and product detail.*